

# high water

## FLOODPLAIN MANAGEMENT SECTION

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### SPRING FLOODING

The threat of flooding was very apparent in many Montana counties this spring. However, more severe flooding did occur as seasonal rains fell on heavy snowpack in the mountains of Madison and Beaverhead counties. The Ruby River in Madison County was flowing at approximately twice its previous maximum recorded flow, which caused flooding in the town of Alder and on other lands along the river. Officials closely monitored the operation of the Ruby Dam and Reservoir. In addition, high water in the Beaverhead River and its tributaries in Beaverhead County caused flooding in Dillon and surrounding areas. Flood waters flowed over the spillway of Clark Canyon Dam for the first time since construction was completed in 1964. The flood would probably have been worse if the dam had not been there. A dam on a small tributary to the Big Hole River in Beaverhead County failed, causing damage to private property and a county road.

Madison and Beaverhead counties were subsequently declared disaster areas by Governor Schwinden. This allowed the release of state disaster recovery funds to be used in repairing damage caused by the floods. It has been estimated that approximately \$600,000 will be needed for this purpose—around \$450,000 in Beaverhead County and \$150,000 in Madison County.

The Disaster and Emergency Services Division of the Montana Department of Military Affairs is looking at ways to mitigate (reduce or eliminate) future flooding in these areas. One way to reduce state disaster expenditures in the future would be to require that flood insurance be taken out on all insurable buildings. An opportune time to include mitigation activities would be during bridge and road repair or reconstruction.

At this time, flood insurance is available to property owners in the Dillon-Beaverhead County area, but not in Madison County.

### MOBILE HOME STANDARDS

The Floodplain Management Section has recently learned that many mobile home manufacturers are not required to incorporate over-the-roof tiedown bands and sleeves into the construction of mobile homes. If the mobile home manufacturer can prove, through engineering designs, that the roof and sidewall assembly is securely attached to the frame of the unit and resists overturning and lateral movement from high-velocity winds, tiedown bands are not required in its assembly.

Nonetheless, mobile homes being placed in an identified floodplain are still required to be secured with over-the-roof and frame ties to resist flotation. The mobile home purchaser is required to supply the hardware for tying down the home if it does not come with the unit. Flood insurance cannot be purchased if the tiedown requirements aren't met.

### ABOLISH SURPRISE FLOODS

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Living and doing business near bodies of water offer enough advantages so much of the time that a great many people deliberately accept the risks. They buy and build cottages on lake fronts, patronize and invest in ocean-front resort hotels, run factories on riverbanks and farm the floodplains, gambling that the satisfaction or profit gained will be worth the risk. And on the whole, they come out ahead. Other floodplain dwellers don't opt for the risk but are rooted in place by financial or other considerations.

Still another type is the homeowner hit by high water without the slightest advance suspicion. That surprise could be eliminated.

It may seem that anyone buying a house or building site would look up local flood history first. But it isn't that easy. Most people don't know how. In our mobile society, families follow the professional peregrinations of the principal breadwinners from cyclone belt to earthquake zone to landslide country and can't become experts in all the local hazards everywhere.

Moreover, the house search often is done under great time pressure. In any case, it isn't a very efficient system that depends on repetition of research again and again from scratch. Why not make flood history in outline part of land-ownership documents? That's the kind of service local governments were created to provide—services that people can provide for themselves much more efficiently collectively (that is, through their local governments) than individually.

Citizens with engineering and hydrologic awareness or expertise might well spur their localities to make the efforts.



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# PLEASE RETURN



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## LEVEES

Several streamside communities in Montana are protected from flooding by structural flood-control levees. Many of these levees afford protection from the 100-year flood. However, many do not offer this degree of protection because of inadequacies in planning, engineering design, or construction practices during placement. Levees in the latter category can lead to a false sense of security for those behind them and even aggravate the flooding problem by increasing flood heights.

Whenever a levee is planned, consideration should be given to the effect the levee will have on flood stages. In an area where there is a designated floodway, one tool is already available to assess the impact on flood stages. Theoretically, the entire flood fringe can be filled in and the increase in flood heights over the preconstruction condition will not exceed 0.5 feet. If a levee must encroach into the floodway, a hydraulic analysis must be performed to determine the effect on flood flows and, especially, stages. Any anticipated development that could occur in the flood fringe area on the opposite side of the stream also must be considered in this analysis.



Improper materials and engineering techniques-levee is failing.

Permanent levees built to protect urban areas must be able to withstand those water velocities thought likely to occur during a 100-year flood. In addition, they must extend in height at least three feet above the base flood elevation. This extra height or "freeboard," which is incorporated purely as a safety factor, addresses the many uncertainties involved with predicting flood heights. Accumulations of debris, such as trees, brush, trailers, cars, etc., also can contribute to increased flood heights.

The state minimum standards for levees recognize that people must be able to take whatever *reasonable* means are necessary to protect themselves and their property during a flood. Disaster officials and floodplain administrators should use caution, however, when deciding whether to allow individuals to build substantial levees for flood control. Such levees, while effectively protecting one property, may actually increase the amount of flood damage experienced by neighboring property

owners. For one financially able property owner to build a levee at the expense of his less financially able neighbor across the stream is not considered a "reasonable" means. In contrast, using sandbags and hay or straw bales to protect one's home is considered a "reasonable" means of preventing damage. Sandbags and straw bales can be easily removed after the flood.



Improper levee—water is seeping through.

In general, FEMA only recognizes as acceptable those levees that satisfy standards of the U.S. Army Corps of Engineers for design and construction. The Corps' current policy is to design levees for use in urban areas to protect against a 500-year flood with three feet of freeboard. Additional freeboard is required on the upstream side of the levee and at all critical points, such as bridge crossings. FEMA, however, will accept a levee that protects against the 100-year flood with three feet of freeboard. All levees must be maintained and operated satisfactorily. The structural integrity of levees is jeopardized when they are filled with gopher holes or overgrown with trees and brush. Unless a levee satisfies these criteria and others, FEMA still considers property protected by them as subject to the 100-year flood. FEMA believes that if any of these criteria are not met, the protection such levees offer is uncertain.

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